

CLINICAL MEDICINE

ORIGINAL ARTICLES



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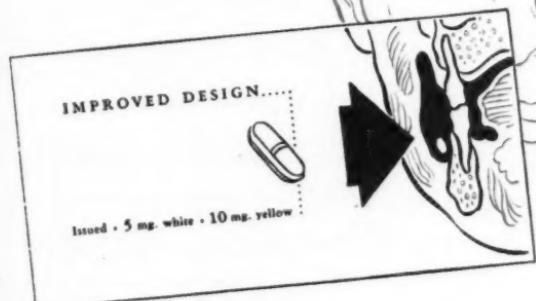
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NOVEMBER, 1948

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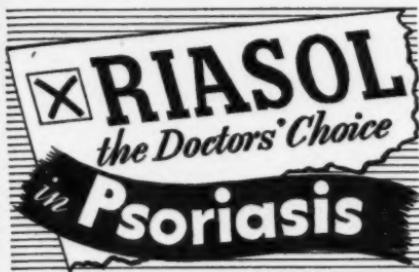
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ORIGINAL ARTICLES

Roentgenologic Contours in Heart Disease

By GEORGE LEVENE, M.D., Boston, Massachusetts

From the Massachusetts Memorial Hospitals and the Boston University
School of Medicine

THE accompanying illustrations have been found useful in teaching cardiovascular roentgenology at the Massachusetts Memorial Hospitals and Boston University School of Medicine. Numerous requests for copies have led us to publish them with the purpose of making them available to those interested. Study of changes in contour should be supplemented by careful roentgenoscopic examination.

Demonstration of total cardiac enlargement is of less importance than identification of the individual chambers involved. The probable cause may then be determined by recalling that the cause of enlargement of any chamber is usually distal to the enlargement. (For example, enlargement of the right auricle is due to a lesion of the tricuspid valve, or inter-auricular septum; en-

largement of the right ventricle is due to a lesion of the pulmonary artery, interventricular septum or left side of the heart; enlargement of the left auricle is due to disease of the mitral valve; enlargement of the left ventricle is due to aortic stenosis, aortic insufficiency or hypertension.)

Symmetrical enlargement may be due to deficiency states or pericardial effusion.

Mitral disease usually produces an increase in the transverse diameter of the heart. Aortic disease usually produces an increase in the length of the heart.

Left-sided failure is associated with pulmonary congestion which is relieved when the tricuspid valve becomes incompetent.

750 Harrison Ave.

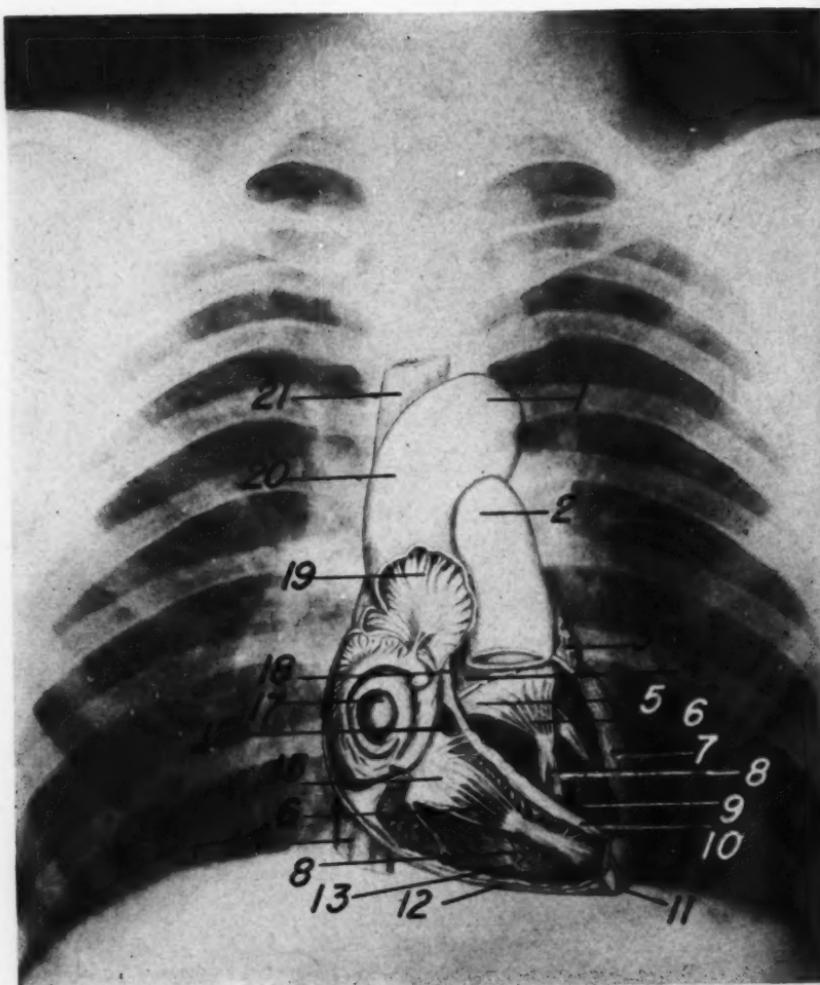


Fig. 1. Beginning of descending aorta ("aortic knob"); 2. Pulmonary artery; 3. Left auricular appendage; 4. Left atrium; 5. Mitral valve; 6. Cordae tendinae; 7. Left ventricular myocardium; 8. Papillary muscle; 9. Left ventricle; 10. Interventricular septum; 11. Apex; 12. Right ventricular myocardium; 13. Right ventricle; 14. Inferior vena cava; 15. Tricuspid valve; 16. Right atrium; 17. Fossa ovalis; 18. Interauricular septum; 19. Right auricular appendage; 20. Ascending aorta; 21. Superior vena cava.

CARDIAC MEASUREMENTS

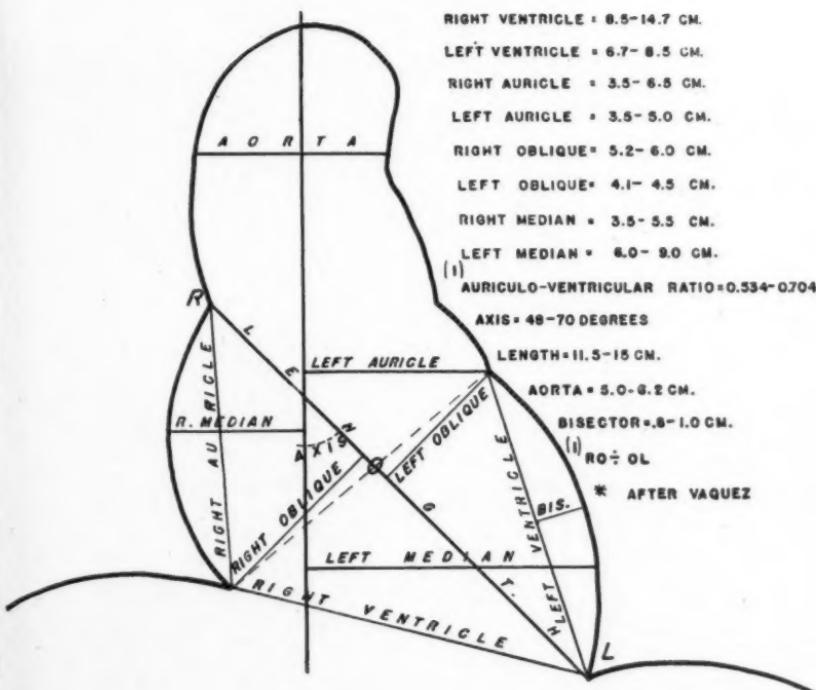
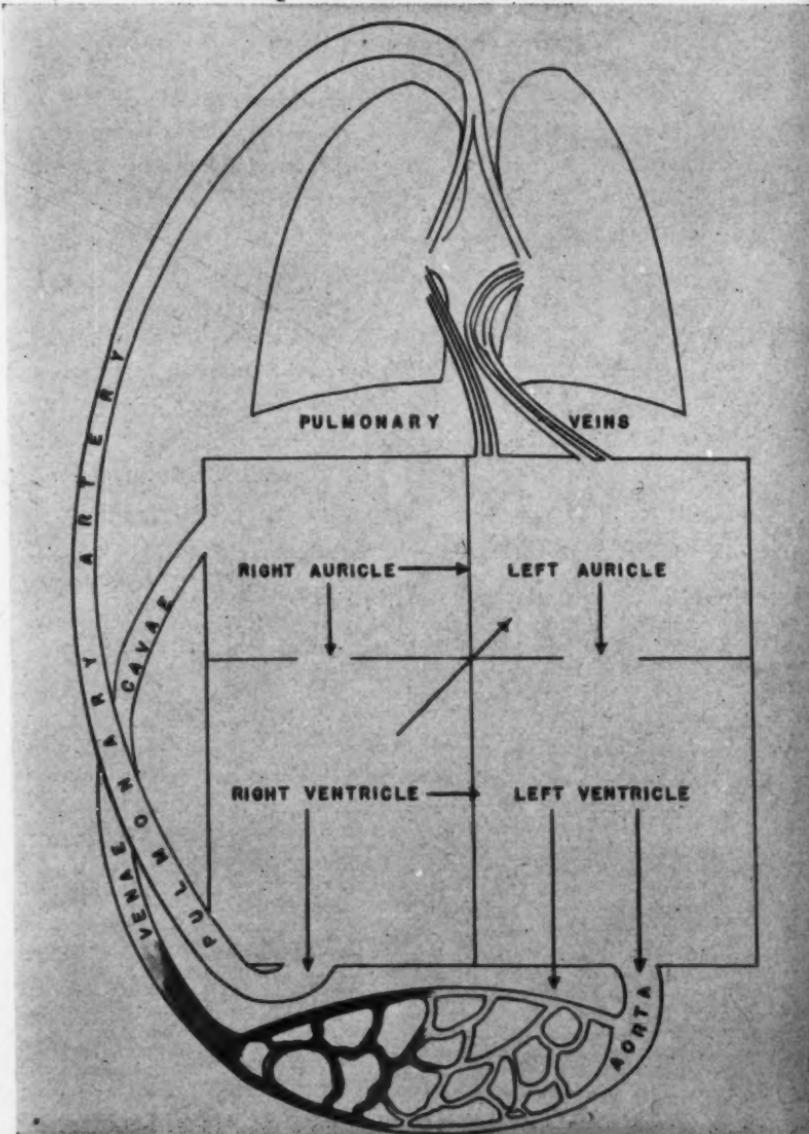


Fig. 2. Cardiac measurements: A line drawn through the center of the spine serves as a base-line. Perpendiculars erected from the point of greatest width on right and left give the right and left diameters (transverse diameter). These correspond to the area of cardiac dullness obtained by percussion. Their sum is normally less than half the measurement of the greatest internal diameter of the chest.

The length (RL) is usually about 1.5 cm. greater than the transverse diameter. A line extending from the junction of right auricle and great vessels (R) to the cardiohepatic angle, measures the right auricle. A line from the cardiohepatic angle to the apex measures the right ventricle. A line from the apex to the auriculoventricular junction measures the left ventricle. A perpendicular to this line, from the point of greatest curve of the border of the left ventricle measures the thickness of the left ventricle. A perpendicular from the auriculoventricular junction to the mid-line measures the left auricle. A line drawn from the cardiohepatic angle to the auriculoventricular junction, intersecting the length (RL), divides the cardiac area into auricular and ventricular segments (RO and OL). Normally the length of RO divided by the length of OL = .534 — .704. If there is a relative increase of auricular area (mitral stenosis), this value rises; if there is a relative increase of ventricular area (aortic disease or hypertension), this value falls. The aortic width is usually measured in the second anterior interspace.

It must be remembered that any measurements of the cardiac shadow are only approximate and that an anatomical diagnosis cannot be made from measurements alone. Usually, however, they suggest the possibilities. Such study, supplemented by careful fluoroscopic examination, frequently suffices to establish an anatomical and functional diagnosis.

ANALYSIS OF CARDIAC ENLARGEMENT ACQUIRED HEART DISEASE



The cause of enlargement of any chamber is distal to the enlargement, e.g., enlargement of the left ventricle is due to an aortic lesion or hypertension.

Fig. 3. If an enlarged cardiac chamber is identified, the cause of that enlargement will be found distal to it (in the direction of blood-flow). An enlarged right auricle may be due to disease of the tricuspid valve or inter-auricular septum (also, constrictive pericarditis); an enlarged right ventricle may be due to a lesion of the pulmonary artery or lungs, or disease of the left side of the heart; an enlarged left auricle may be due to a lesion of the aortic valve or to hypertension.

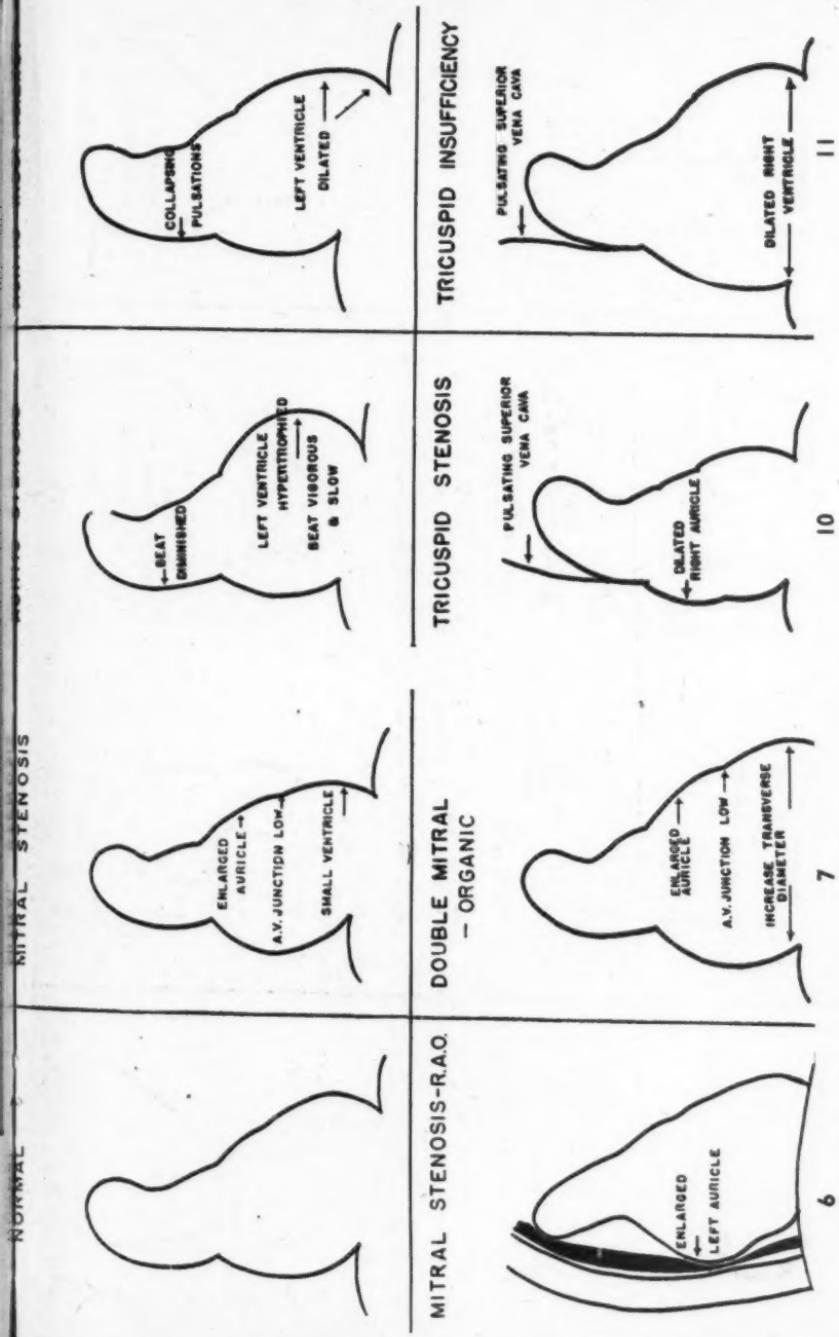
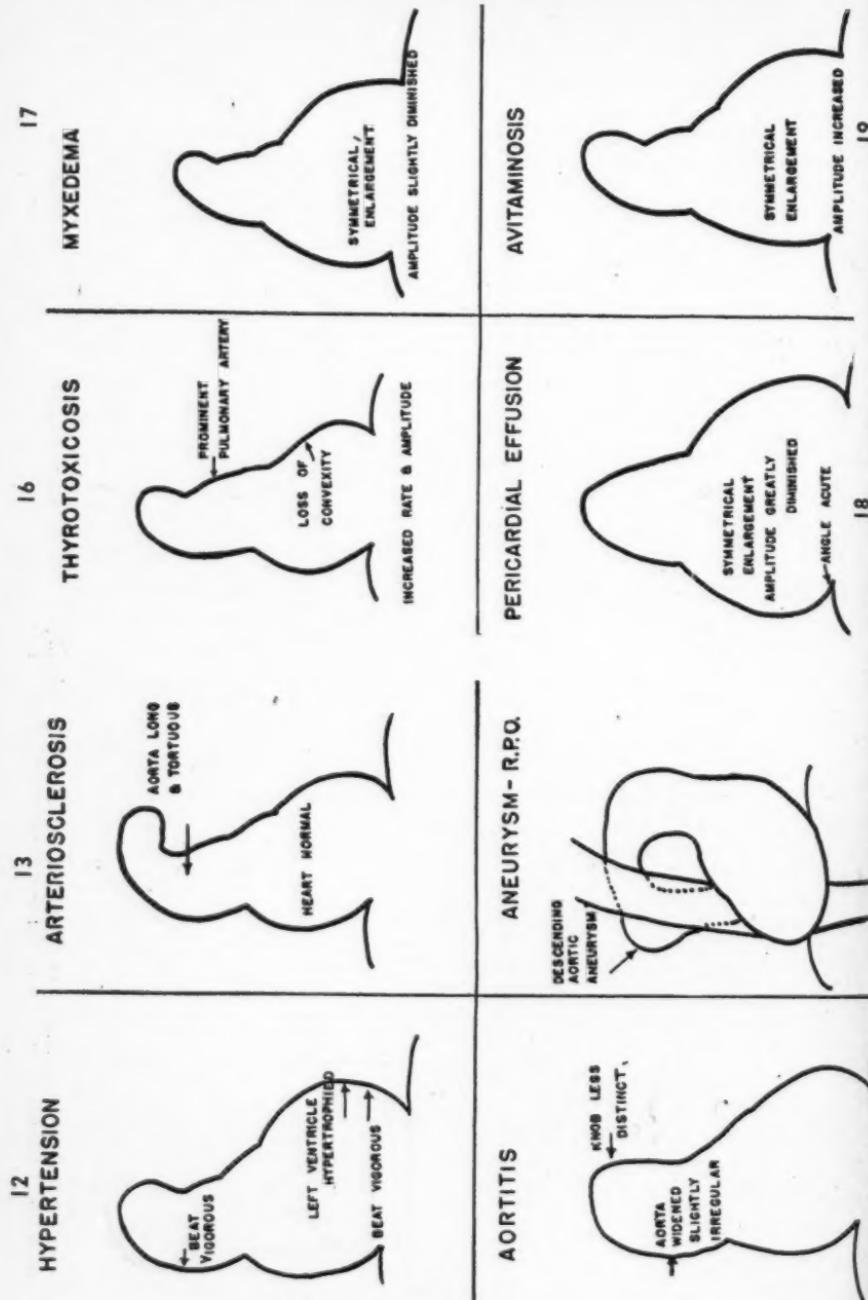
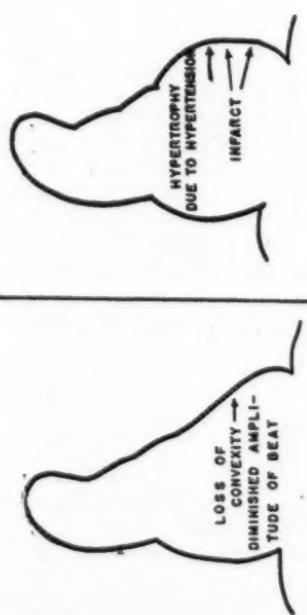


Fig. 7. *Mitral Stenosis.* Lower left illustration shows pressure deformity of the esophagus produced by the enlarged left auricle; patient rotated to right anterior oblique position.



ORIGINAL ARTICLES

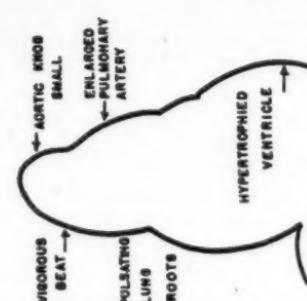
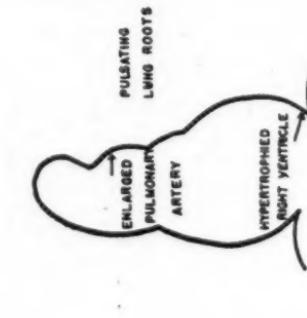
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21 HYPERTENSION WITH
MYOCARDIAL INFARCT



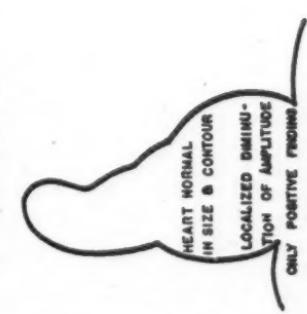
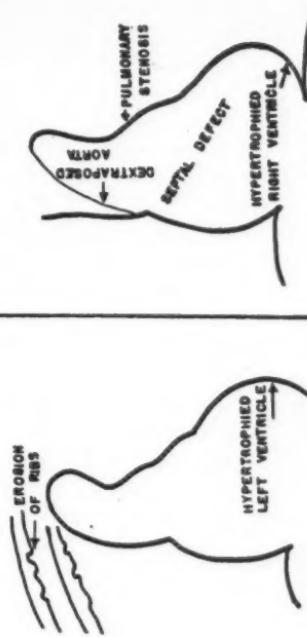
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NORMAL CONTOUR



24 PULMONARY STENOSIS
25 PATENT DUCTUS
ARTERIOSUS



26 COARCTATION OF AORTA
27 TETRALOGY OF FALLOT



Clinicopathologic Conference (16)*

A two month old female infant was brought to the hospital because of increased fussing, persistent crying and projectile emesis for 3 days.

The infant had been born prematurely and had weighed 2 lbs. 14 oz. at birth. The labor had been difficult and had lasted seven hours. She was the second child of a twenty-seven year old mother. From birth until present illness the child had thrived on a standard formula given every three hours.

For three days prior to entry the infant had vomited forcibly every feeding. A variety of changes in formula had not interrupted the vomiting, nor the infant's constant fretfulness.

Examination revealed a constantly crying infant weighing 5 lbs. 5 oz. Temperature was normal and pulse, respirations and blood pressure could not be accurately measured. The skin was pale and of good turgor, but over the left gluteal region were ecchymotic areas which appeared to the examiner to be the marks of adult fingers. The fontanels and suture lines of the skull were normal. The circumference of the skull in the fronto-occipital plane was 35.8 cm. Examination of the ears, nose and throat, the chest and the abdomen were completely unremarkable. The tendon

*Credit: Adapted from *Bull. Children's Hospital* (Denver, Colorado), 1, 4, 119, 121, October, 1947.

reflexes were generally and appreciably hyperactive.

Laboratory: Red blood count was 2,840,000, hemoglobin 6.25 gms; nucleated red cells 3 per 100 cells counted; white blood count 19,300 (polymorphonuclears 46, lymphocytes 52, mononuclears 3). Urinalysis: Many white blood count and occasional red cells (subsequently cleared without treatment). Sternal marrow was essentially normal.

Course: Patient vomited several feedings during first four days, but retained food which was refed. There was no visible peristalsis. After a small weight loss, normal increase was obtained. Infant was somewhat listless and pale, but not irritable as described by parents.

What do you think is the diagnosis, and what therapeutic procedures should be undertaken? Stop and think this out before reading the answer.

Diagnosis: Subdural Hemorrhage, possibly related to hand-prints on the buttocks.

Treatment and Course: Lumbar puncture was done; initial pressure was 150 mm. of water. Fluid withdrawn was homogeneously red and xanthochromic. Bilateral subdural taps were done at intervals of several days and 50 to 100 cc. of bloody fluid removed at each tap. The vomiting ceased, the infant was no longer fretful, and weight gain continued. Small transfusions improved the hematologic picture.

Guard well your spare moments. They are like uncut diamonds. Discard them and their value will never be known; improve them and they will become the brightest gems in a useful life.—EMERSON.

PROBLEMS IN PRACTICE



The Hand: Identifying Finger Joints

Question: How can I identify the joints of the fingers, in relation to the skin creases? Especially in an injured or swollen finger, it is hard to tell from landmarks which are distorted.—Medical student, New York City.

Answer: Grant's "Atlas of Anatomy" offers a tracing of an x-ray of an extended hand, over which lead shot were placed on skin creases so as to indicate the relationship of the creases to the joints. (See Fig. 1 adapted from Grant). Fig. 2 indicates the outlines and skin creases of a normal hand of the same size and in the same position.



Fig. 1



Fig. 2

Burning Feet

Question:

I have a patient whose only complaint is of burning sensation in the feet. There is no obvious lesion on examining the feet. What is the diagnosis? Can any treatment be given, and if so, what?

M. D., Alabama.

Answer:

Diagnosis: Erythermalgia or Weir-Mitchell's Disease is characterized by burning of the feet. In this vasodilator disease syndrome, the burning pains are increased by warmth and dependency, the skin is warm and pink or with red blotches, the involvement is usually bilateral and symmetrical, circulatory function tests indicate vasodilatation, symptoms are relieved by elevation and exposure to colder temperatures and there is an increase in oxygen concentration of the venous blood from the foot.

It must be differentiated from arteriosclerosis, thromboangiitis obliterans, Raynaud's syndrome (symptoms are worse on cold) and polycythemia.

Treatment of erythermalgia includes: 1. Acetylsalicylic acid in 10 grain doses four or five times daily; 2. desensitizing the feet to heat by daily soaking them in warm baths and gradually increasing the temperature to 30° C.; 3. use of vasoconstrictors such as the inhalation of 1:100 adrenalin or hypodermic injection of several minims of adrenalin 1:1,000; 4. avoidance of exposure to heat (David W. Kramer).

The condition is usually functional but may be associated with or precede mul-

iple sclerosis, tabes or syringomyelia (E. Farquhar Buzzard). Burning paresthesias occur in neuritis due to heavy metals (arsenic or lead) or arteriosclerosis involving the central nervous system.

Edgar Allen suggests that the differential diagnosis be made upon the warmth of the skin, i.e. if unusual warmth of the skin is associated with subjective burning the condition is probably erythermalgia; if the skin is cold and the patient complains of burning, it is not.

Other methods of treatment include histamine injections (histamine desensitization) carried out by giving 0.025 mg. (1/2400 gr.) of histamine subcutaneously twice daily, with gradual increase of dose so that the patient is receiving .1 mg. (1/600 gr.) daily at the end of a week. Thereafter 0.1 mg. is given hypodermically twice daily for 2 weeks and a maintenance dose of 0.1 mg. hypodermically twice weekly. If flushing of the face occurs, the dose should be decreased one-half. Ampules are obtainable which contain 0.275 mg. of histamine diphosphate equivalent to 0.1 mg. of histamine base.* (Allen).

It is assumed that you have looked closely for the lesions of trichophytosis of the toes and feet, with the itchy patches between the toes. This fungus infection (athletes foot) is quickly relieved by $\frac{1}{2}$ percent salicylic acid in alcohol applied twice daily.

*Ampule number 338, Eli Lilly and Company, Indianapolis, Indiana.

Hospital Planning

Question:

Our small city (population 5,200) is going to build a hospital. Where can we find out the details necessary in planning the program needed, enlisting public support, educating the proposed hospital board, general principles of hospital construction and so on? We do not need a technical manual on hospital construction as the architect will do that later. What we need now is a general guide to both laymen and physicians to steer them around pitfalls.—M.D., Colorado.

Answer:

The Commonwealth Fund publishes just such a book, which embodies their experience in actually supporting the construction of a dozen such rural hospitals. It is a very commonsense book which can be read with profit by both the lay persons interested in the future hospital and by the physicians who thus get some of the laymen's attitudes and avoid future difficulties.

SOUTHMAYD, HENRY J. and SMITH, GEDDES: Small Community Hospitals. The Commonwealth Fund, New York City. 1946. \$2.00.

PROBLEMS IN PRACTICE

Bleeding After Cervical Operation

Question:

What kind of packing will stop bleeding from a cervix? Recently, I removed a chronically infected cervix; while inserting the sutures, the patient stopped breathing. During the ensuing time, we were occupied getting the patient to breathe and no more sutures were inserted into one side of the cervix. Eventually, recurring hemorrhages from this area, despite gauze firm packing, oxidized gauze and gelatin foam packing and thrombin on fibrin foam, compelled

the insertion of sutures. M. D., Des Moines, Iowa.

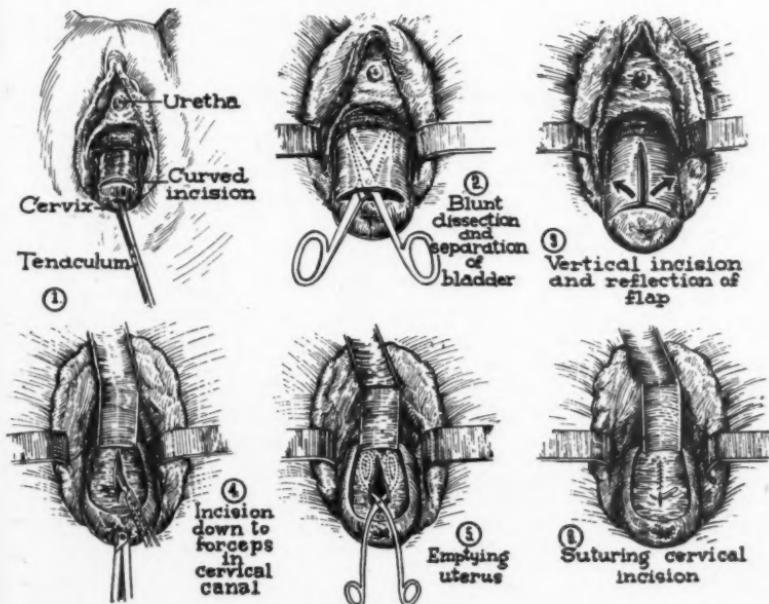
Answer:

Arterial bleeding requires suture. Don't pack — suture as you invariably must do. This is, of course, not true where the cervix has been cauterized or a biopsy performed, unless the latter was deep. Oxidized gauze (Oxycell, Parke Davis and Company) or gelatin foam (Gelfoam, Upjohn and Company) may be inserted after cauterization or for subsequent bleeding, and need not be removed.

Miscarriage: Simplified Surgical Treatment

To avoid injury to the cervix, when a pregnancy must be terminated prematurely, one may incise the anterior vaginal and uterine walls. Dr. von Friesen, M.D., of Stockholm, suggests that a curved incision be made superior to the cervix, blunt separation of the bladder

be performed, the anterior wall of the cervix incised and forceps be introduced to empty the uterine cavity. Suturing of the cervical incision is followed by that of the vaginal mucosa. (Original illustration by T. Lozier, adapted from article in *Acta ost. et gynec. Scandinav.* 27 (fasc. I): 80-83, 1947).



DIAGNOSTIC POINTERS

Pulmonary Embolism After Intramuscular Injection

A few moments after the intramuscular injection of an insoluble drug (mercury, bismuth salicylate, penicillin in oil), the patient may experience shock, collapse and pain in the chest, plus a metallic taste in the mouth. Generally he survives but he may be very ill for several weeks. Such a situation means that pulmonary embolism has occurred.—A. F. KRAETZER, M.D. in "Procedure in Examination of the Lungs" (Oxford University Press).

Diphtheria in Partially Immune Persons

The average American physician, who constituted the bulk of the medical corps since the days of mobilization, was initially not well acquainted with clinical diphtheria. His concept of the pharyngeal lesion was that of childhood diphtheria commonly found in textbooks. Diphtheria in partially immune persons, and accordingly that of many adults, is often somewhat different: "Less than one third of the diseased throats were suggestive of diphtheria, while more than one half the lesions were those of follicular tonsilitis."—HARTWIN A. SCHULZE, M.D., Diphtheria in the U. S. Army in Europe, *M. Bull.*, June 1947.

Abruptio Placenta

When during pregnancy one notices a progressive increase in the size of the uterus, increasing pain, decreasing ability of the uterus to contract and relax, uterus becoming harder and more tender and signs of hemorrhage and shock, abruptio placenta is occurring and should be handled by blood transfusion and cesarian section. If the uterus fails to contract, it should be removed.

Early Symptoms of Gastric Cancer

Thorough gastrointestinal study, including x-rays, should be employed if a person past 35 years of age complains of 1. loss of desire for meat, 2. mild distress related to meals, 3. loss of appetite, and 4. tired and weak feeling. One should be on the alert for a history of fatigue and anorexia, particularly for meat, associated with discomfort either before or after eating. In this way one has the opportunity of making an early diagnosis.—G. C. ENGEL, M.D. (Graduate School of Medicine, University of Pennsylvania, Philadelphia) in *J.A.M.A.*, Nov. 15, 1947.

Pain at Night

Pain which awakens the patient at night is almost always on an organic basis. Functional pains do not awaken.—GORDON KAMMAN, M.D., Miller Hospital, St. Paul, Minnesota in *Minnesota Med.*, Nov. 1946.

Peptic Ulcer Hemorrhage and Perforation

The axiom "a bleeding ulcer does not perforate and a perforating ulcer does not bleed" is untrue. Three patients dying of hemorrhage proved at autopsy to have a perforation as well. Perforation may recur from two to five times.—KARL A. MEYER, M.D. (Cook County Hospital, Chicago) in *Surg. Clin. N. Am.*, Feb. 1947.

Hyperthyroidism or Cardiac Failure?

A plus 40 or 50 basal metabolic rate is common in patients with congestive heart failure who need not exhibit dyspnea or cyanosis.—SCHERF & BOYD "Cardiovascular Diseases" (Lippincott)

Thumbnail Therapeutics



Postpartum Hemorrhage

Postpartum hemorrhage is often due to too deep anesthesia, prior use of oxytocics such as pituitary extract and premature attempts at expression of the unseparated placenta. Intravenous and intramuscular injections of ergotrate (ergonovine) are more effective than pituitary preparations in controlling uterine hemorrhage. If not effective, give intravenous pitocin (not pituitrin). —WILLIS BROWN, M.D. in *J. Iowa S.M. Soc.*, May 1948.

Resuscitating the Newborn

The newborn infant who does not breathe may be resuscitated by rocking him back and forth (see-saw method of Eve—see *Clinical Medicine* article and original illustrations May 1945, p. 147-151), first with head high and then with it low. Mucus should be sucked from nose and throat before inverting the baby.—R. S. MILLEN, M.D. (Long Island, N.Y.) in *Amer. J. Ob. & Gyn.*, Sept. 1946.

Poisoning by Concentrated Acids and Alkalies

In instances of poisoning, by concentrated acids and alkalies, a stomach tube should not be introduced. For chemical neutralization, weak acids or alkalies should be administered by mouth, such as vinegar, lemon juice and tartaric acid for poisoning by alkalies, and milk of magnesia and limewater as antidotes for poisoning by acids. The alkaline carbonates, which liberate carbon dioxide, should not be employed as antidotes.—J. TRAVELL, in "Cornell Conferences on Therapy", 1946.

Cure of Urinary Incontinence Due to the Paralytic, "Neurogenic" Bladder

Neurogenic bladder dysfunctions, whether due to spinal cord trauma, congenital anomalies, inflammation, degeneration or neoplasm, can be remedied by transurethral relief of the spastic bladder neck and vesicle neck obstruction which prevents proper emptying of the bladder. The urinary incontinence is usually not a constant drip but urine escapes in spurts intermittently.—O. E. SARFF, M.D. (Urologist, St. Luke's Hospital, Duluth, Minnesota) in *Minnesota Medicine*, April 1948.

Treatment of Chilblains

Nicotinic acid given orally in doses of 50 mg. for an adult and 25 mg. for a child, thrice daily, immediately after meals, relieves most cases of chilblains. The dose may need to be increased to 300 mg. daily, before pain in the hands and feet is relieved.—R. JOHN GOURLAY, M.D. in *Brit. Med. J.*, Feb. 21, 1948.

Rest in Congestive Heart Failure

Patients with congestive heart failure should be placed in bed until compensation is restored, but complete quiet in bed may aggravate the failure since the whole load of the circulation is thereby placed on the heart. Such patients should, as far as possible, perform deep breathing and skeletal muscle exercises to assist in circulating the blood. Movement of the limbs should be demanded periodically and allowed constantly. Lavatory privileges should be permitted at an early date.—M.D.



NEW BOOKS

Practical Office Gynecology

By Karl John Karnaky, M.D., Assistant Professor of Clinical Gynecology, Baylor University College of Medicine, Houston, Texas, etc.—Charles C. Thomas. 1947. \$7.50.

The author is to be congratulated on his stand against unnecessary surgery in gynecology. His text describes and illustrates many office procedures which are effective without recourse to surgical procedures. It is a very practical work and yet the scientific background is not lacking. There is a complete review of its field and, interestingly enough, some very common sense remarks on the place of sex in the care of patients.

Hodgkin's Disease and Allied Disorders

By Henry Jackson, Jr. A.B., M.D. Assistant Professor of Medicine, Harvard Medical School; And Frederic Parker, Jr. A.B., M.D. Associate Professor of Pathology, Harvard Medical School.—Oxford University Press, 1947. \$6.50.

A very worthwhile monograph on the disorders comprising the Hodgkin's syndrome and lymphoid tumors. The authors emphasize that Hodgkin's disease should be divided into 3 types, namely paragranuloma, granuloma and sarcoma, because they differ in clinical and pathologic courses and appearances.

The Management of Fractures, Dislocations and Sprains

By J. A. Key, M.D., Clinical Professor of Orthopedic Surgery, Washington University Medical School, St. Louis, etc. and H. E. Conwell, M.D., Associate Professor of Orthopaedic Surgery, University of Alabama School of Medicine, Birmingham.—Mosby Company. Fourth Edition 1947. \$15.00.

This large volume contains all the information, in type and illustrations, needed to manage all the fractures and dislocations encountered by the average surgeon. It is that rare book, that tells the truth and nothing but the truth, without "talking down", and with facts that have been proven in private, university and industrial experience. It stands the test of being consulted in a series of actual fractures as they were encountered in practice, and giving good, usable advice every time.

Concise Anatomy

By Linden F. Edwards, Ph.D., Professor of Anatomy, Ohio State University, Columbus, Ohio.—Blakiston Co. 1947. \$5.50.

A clear, well illustrated textbook for students who are not studying medicine (nurses, dentists, coaches). General anatomy is presented first, followed by a discussion of each portion of the body, i.e. extremities, head, neck and trunk and splanchnology. Surface anatomy is stressed.

Hypnotherapy

By Margaret Brenman Ph. D. and Merton M. Gill M.D.—International Universities Press. \$4.50. 1947.

This is the answer to the oft heard inquiry, "where can I read something scientific on hypnosis? The authors correlate our present knowledge of the theory and practical application of hypnosis. They provide discussions of the relation of psychology and psychoanalysis and inquiries into the "influence of emotions on memory." The four case reports provide interesting reading and demonstrate the practical application of hypnotherapy. The book certainly could be classed as a "must" for the psychoanalytic student.—E. Delehanty, Jr.

Atlas of Practical Incisions and Some Operative Procedures

By Oliver C. Cox, M.D.—Williams and Wilkins Co., 1947. \$3.00.

Drawings showing incisions for appendectomy, gallbladder surgery, undescended testicle, Pfannenstiel and reverse Pfannenstiel incisions, technic of pilonidal cyst, circumcision and dasicte enter-erosotomy, followed by many black and white photographs showing the resultant healed incision. The rationale of the book is not clear.

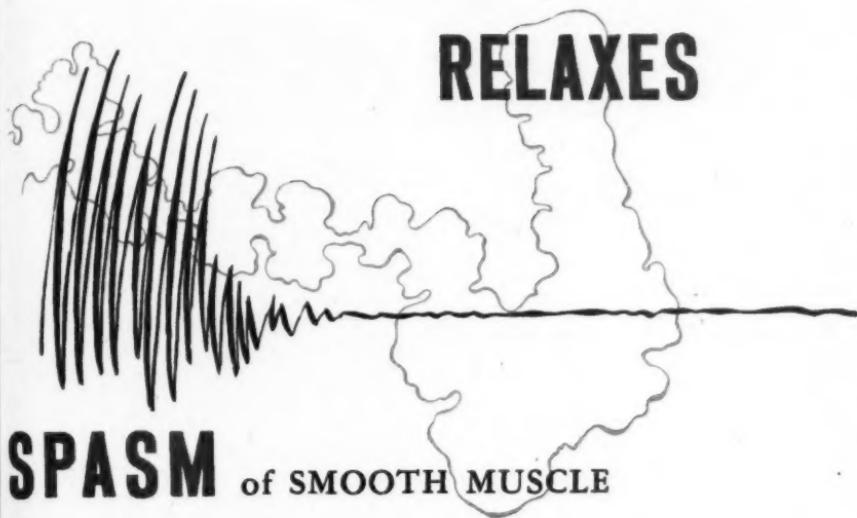
Hospital Care in The United States

Commission on Hospital Care. The Commonwealth Fund. 1947. \$4.50.

A thorough going study of what the general hospital does, what types of illnesses should be cared for, its relationship with the patient, its inner activities both medical, nursing and general staff, and how its services may be extended. The Commission on Hospital Care has carried out a very workmanlike, systematic survey. Its recommendations are amplified with details and supporting facts.

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MEDICAL NEWS

Medical Officer Positions

An examination has been announced by the U. S. Civil Service Commission for filling Medical Officer positions at salaries ranging from \$4,479 to \$6,235 a year. The positions are located in Washington, D. C., throughout the United States, and in the Panama Canal Zone, in such agencies as the Indian Service, Panama Canal Service, U. S. Public Health Service, Dept. of the Army, Veterans Administration, Civil Aeronautics Administration, and the Railroad Retirement Board.

No written test will be required. To qualify, applicants must be graduates of a medical school and must be currently licensed to practice medicine and surgery.

Information and application forms may be secured at most first-and-second-class post offices, from Civil Service regional offices, or from the U. S. Civil Service Commission, Washington, 25, D. C. Applications will be accepted in the Commission's Washington office until further notice.

Chloromycetin Shows Encouraging Results

First reports from a United States Army test station recently set up at Kuala Lumpur, Malaya give strong indications that the recently discovered anti-biotic, chloromycetin, may prove as effective against scrub typhus as was hoped.

Dr. J. E. Smadel, director of virus research at the Army Medical Center, in Washington, and a co-discoverer of chloromycetin reported results of treatment compared with an untreated "control" group. Dr. Smadel and his group found that chloromycetin markedly reduced duration of fever, period of hospitalization, and incidence of complications in scrub fever.

Why More Divorces?

Tightening our divorce laws will not cut down the number of divorces, George Thorman declares in an illustrated and informative Public Affairs Pamphlet. "The fact is, that the divorce problem is not basically a legal problem. Therefore, an attempt to solve it by passing new laws is foredoomed to failure."

Nor does the fact that divorce is breaking up marriages 3 times as rapidly as it did a half-century ago necessarily mean that there are more unhappy marriages. It may simply mean that more people, who are unhappily married, seek divorce than before because they find less reason to stay married.

Many marriages which were once held together by the external pressure of economic necessity or of social disapproval will fall apart once these props are removed. *A modern marriage must be held together from within rather than*

(Continued on page 14)

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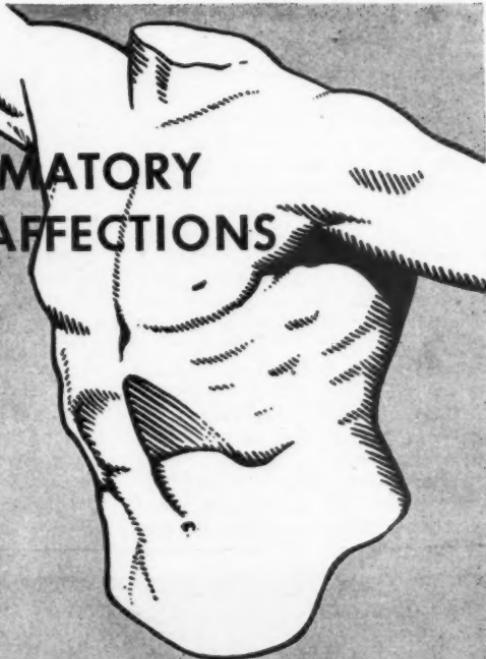
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MEDICAL NEWS

(Continued from page 12)

from without. The rapid increase in divorce is seen as a reflection of the difficulty we are having "in making marriage suit modern needs and fit in with our changing world."

Women with more freedom and economic independence have changed their attitude toward marriage . . . A marriage is no longer "good" just because it lasts. Women who were once content to endure cruelty or immorality on the part of their husbands now are rebelling. They expect more from marriage than economic security, legalized sex relations, unrestricted procreation, and female domesticity.

The emphasis upon freedom from coercion and the belief that the interests of the individual take precedence over the value of a marriage pact put the destiny of marriage in the hands of the two marriage partners rather than into the hands of the law. Yet this increased freedom should make happier people, and

happier people should make better marriage partners.

This pamphlet also deals with the problems of desertion ("the poor man's divorce") and involuntary separations as well as divorce. The price is .20c and it is obtainable from the Public Affairs Committee, Inc., a non-profit educational organization at 22 East 38th Street, New York City, 16.

Fluoroscope Images 500 Times Brighter

This new tube is expected to increase the brightness of fluoroscopic images by 500 times. A fluoroscopic x-ray image amplifier developed by the Westinghouse Research Laboratories is based on information gained in four years of intensive study resulting in the actual amplification of an x-ray image. Basically, it will consist of a high vacuum tube that electrostatically focuses and accelerates an electron stream. When perfected, the device will take the form of an at-

(Continued on page 16)

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MEDICAL NEWS

(Continued from page 14)

tachment for standard fluoroscopic equipment.

The new image amplifier increases the brightness of the fluoroscopic image after the x-rays have passed through the patient. This solution to a long felt problem is necessary because the x-ray intensities are already at the patient's tolerance level and is possible because the sensitivity of the physician's eyes are the main limitation to effective fluoroscopy today.

Increased brightness of the x-ray image has been attained by converting the x-ray quanta into light with a fluorescent screen and thence to electrons by means of an adjacent photo-electric surface. These electrons are accelerated by a high potential placed across the vacuum tube, giving a brightness gain of 20 times. A further factor of 25 in brightness gain is attained by electro-static focusing of the electron stream to reduce the image to 1/5 of its size. The reduced image, now brightened 500 times, impinges on a phosphor output layer that converts it back to a visible image. The visible image is observed through a conventional optical system.



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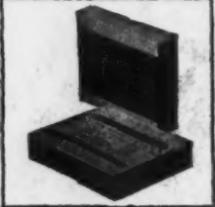
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